



Illinois Department of Transportation

Memorandum

To: ALL BRIDGE DESIGNERS 05.3

From: Ralph E. Anderson *Ralph E. Anderson*

Subject: Drainage Details for Structures

Date: September 30, 2005

This memorandum is the result of a joint effort between the Districts, AGCI, IRTBA and the Bureau of Bridges and Structures to clarify excavation, backfill and drainage treatment issues for walls and abutments. Existing details were revised and new details were developed to depict a more consistent drainage philosophy for all structure types. Some of the significant revisions are described in the following paragraphs.

Integral, Semi Integral and Pile Bent Abutments. The Geotechnical Fabric for French Drains will no longer be required along the 1:1 slope between the existing soil and backfill. Its use will be limited to encasing the drainage aggregate around the perforated pipe underdrain. A geocomposite wall drain has been added to the detail to ensure efficient drainage to the pipe underdrain. The pipe underdrain, drainage aggregate, and geotechnical fabric will all be included in the pay item PIPE UNDERDRAINS FOR STRUCTURES covered by the new Guide Bridge Special Provision (GBSP) 51. The geocomposite wall drain will be measured and paid for according to the Standard Specifications. In addition the backfill material has been redefined as Porous Granular Embankment (Special) to better distinguish it from the embankment material specified in the roadway plans. Porous Granular Embankment (Special), as covered by GBSP 52, is a newly created item where the aggregate types and gradations have been expanded to reduce cost, provide Districts with more alternatives, and eliminate the need for geotechnical fabric against existing soil as previously noted.

Vaulted Abutments. A detail for drainage treatment of filled vaulted abutments has been developed. The sand backfill has been replaced with PGE (Special) and the use of the geocomposite wall drain and pipe underdrain have been introduced.

T-Type Retaining Walls and Closed Abutments. PGE (Special) will only be required to assist with drainage in areas as detailed. It is not necessary to backfill other areas within or beyond the structure excavation limits with PGE (Special). The remainder of the backfill material is intended to match the material specified by the roadway plans. Excavation beyond the structure excavation limits and any subsequent backfill for this same area shall not be measured for payment. Backfill for structure excavation in front of walls or

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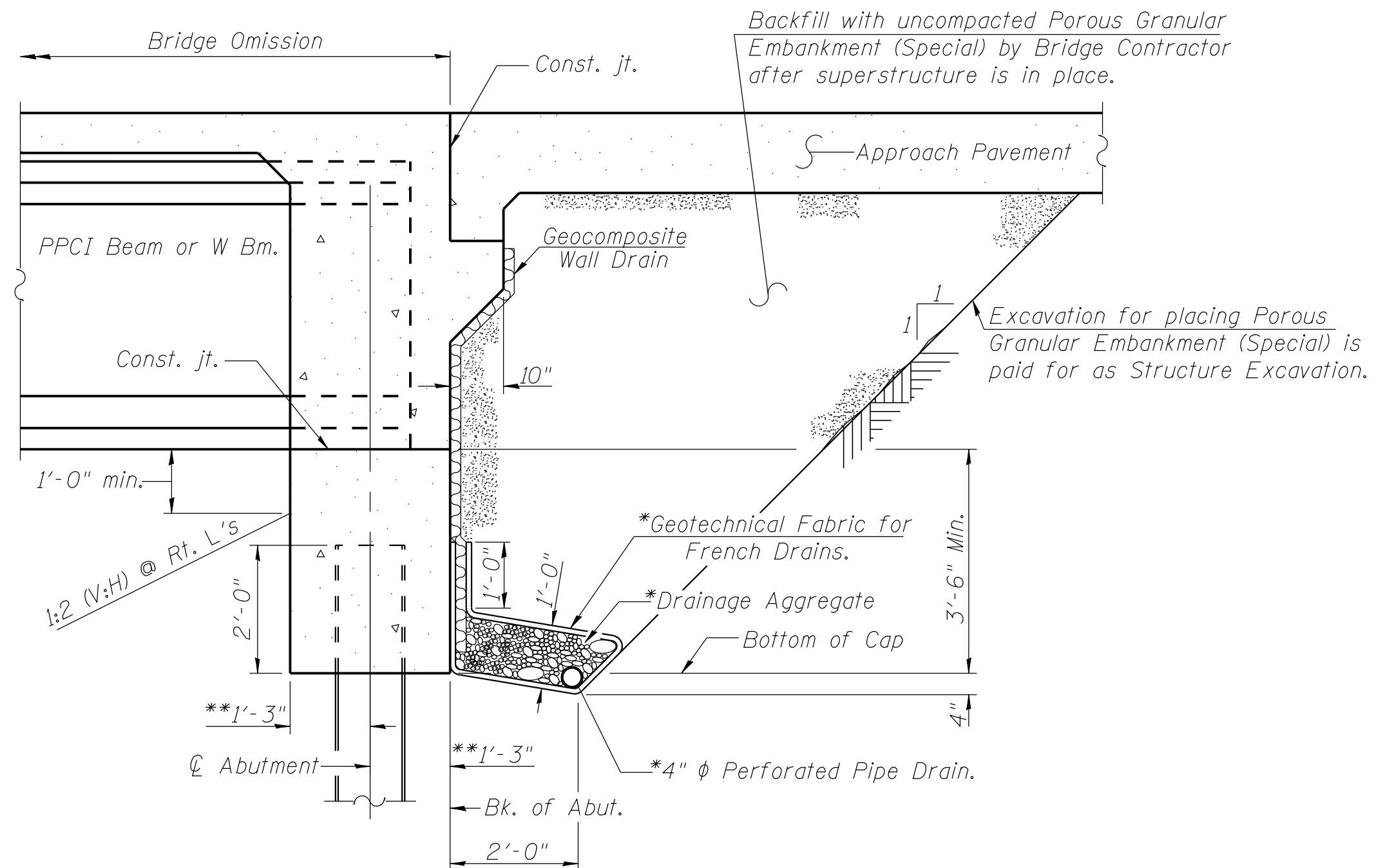
around piers shall be performed according to the Standard Specifications or the roadway plans. PGE (Special) is not intended or required in these areas.

Soldier Pile Walls. Typical cross sections were developed depicting the components and drainage details required. Additional details and policies for soldier pile walls will follow in the future.

Attached are new or revised details as described above. The new GBSP 52 "POROUS GRANULAR EMBANKMENT (SPECIAL)" and the revised GBSP 51 "PIPE UNDERDRAINS FOR STRUCTURES" may be found on the IDOT web site. Designers are encouraged to implement these new details and special provisions on all applicable projects which have not been let; however, all applicable projects beginning with the March 10, 2006 letting shall utilize these new details and special provisions.

WMK/KLR/bb26611

TYPICAL SECTION THRU
INTEGRAL ABUTMENT

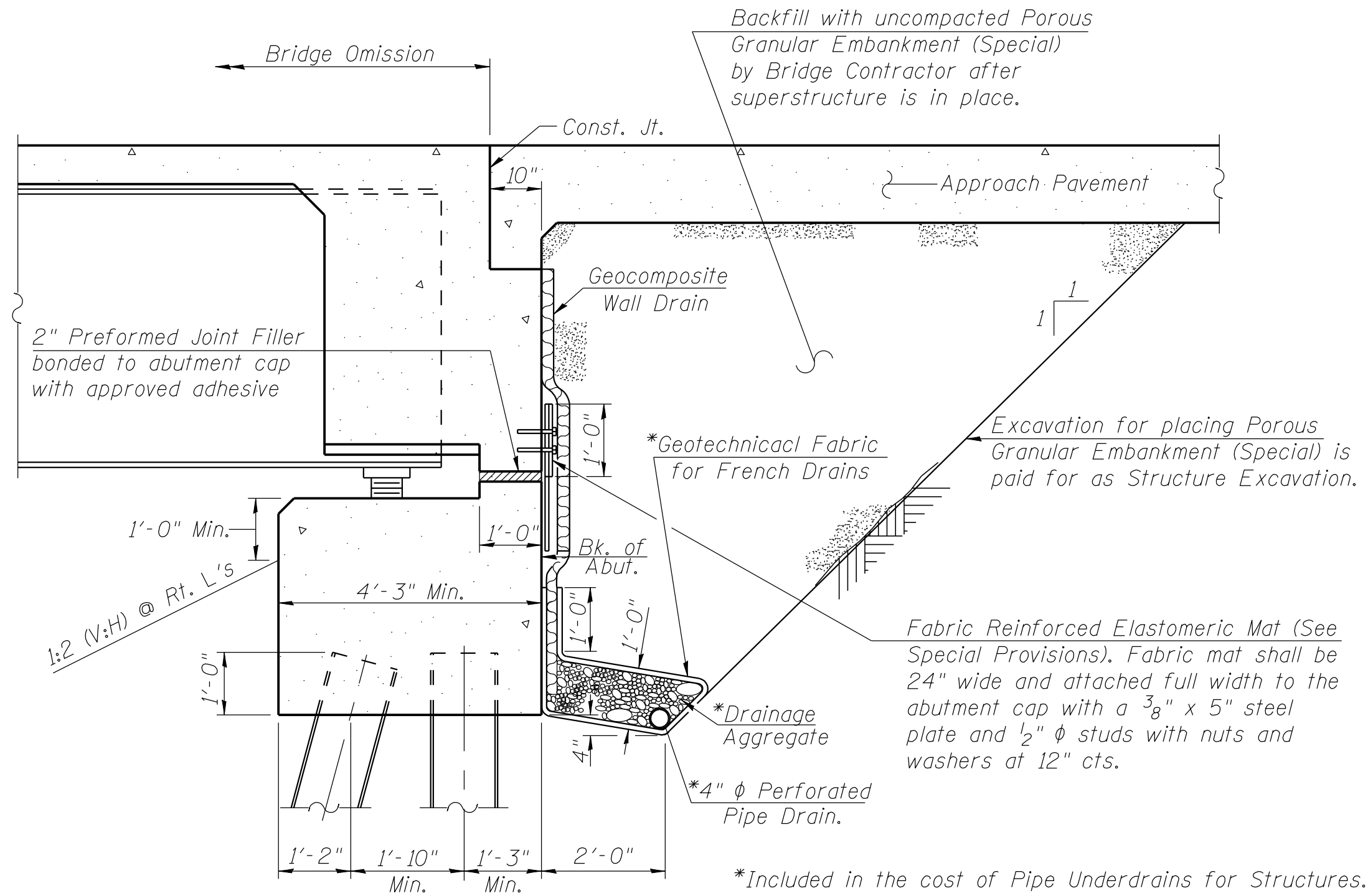


*Included in the cost of Pipe Underdrains for Structures.

**1'-6" for Bulb-T.

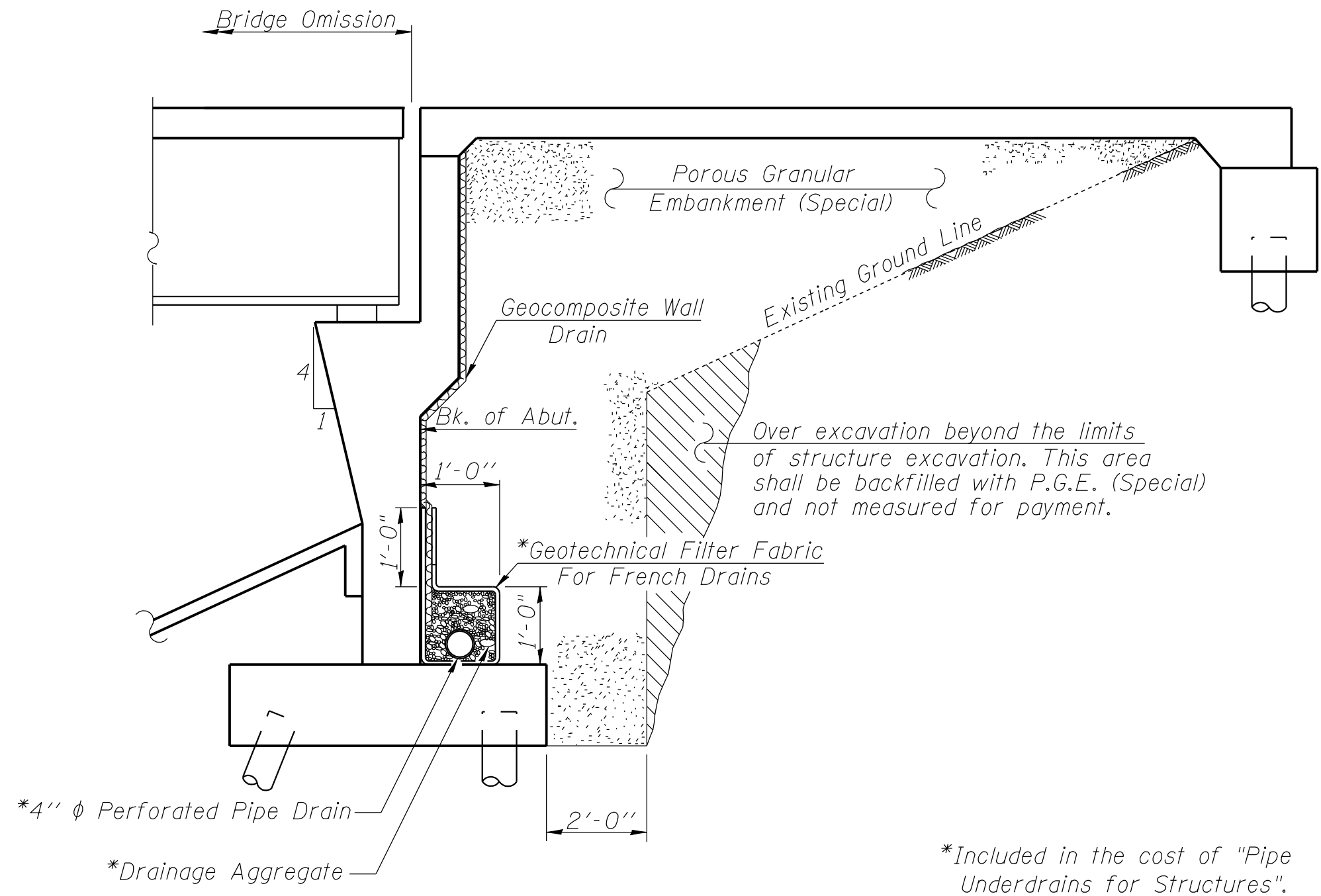
All drainage system components shall extend to 2'-0" from the end of each wingwall except an outlet pipe shall extend until intersecting with the side slopes. The pipes shall drain into concrete headwalls. (See Article 601.05 of the Standard Specifications and Highway Standard 601101)

TYPICAL SECTION THRU
SEMI-INTEGRAL ABUTMENT

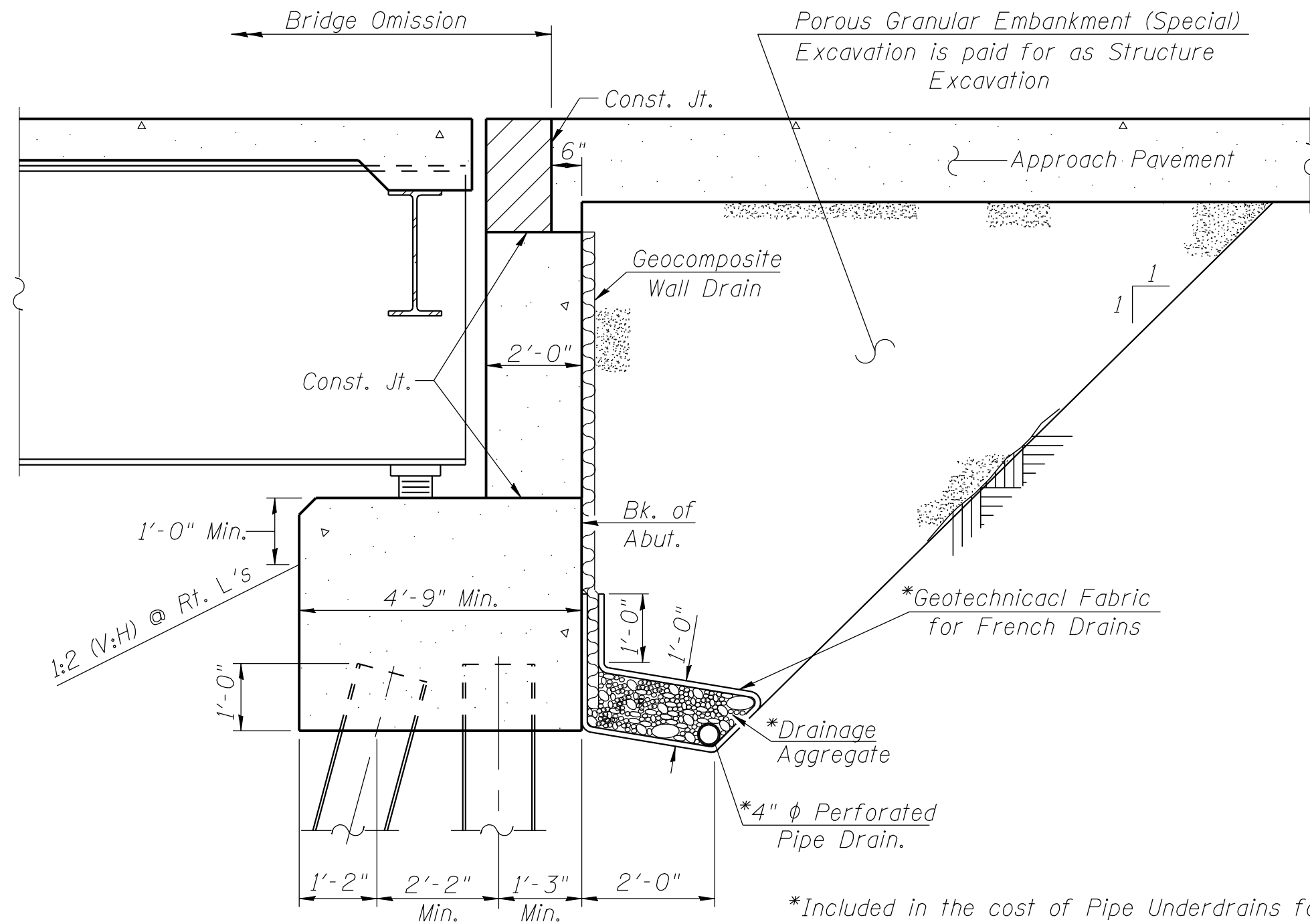


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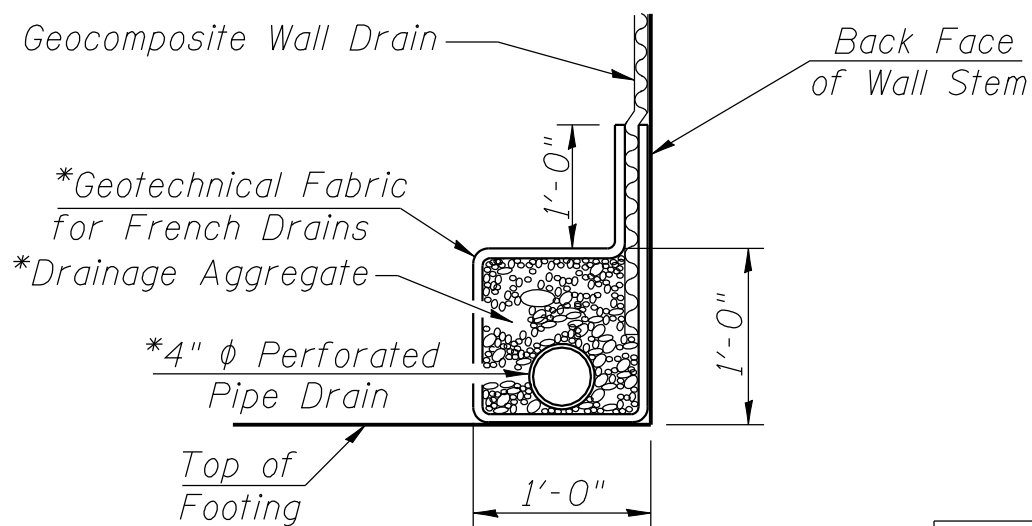
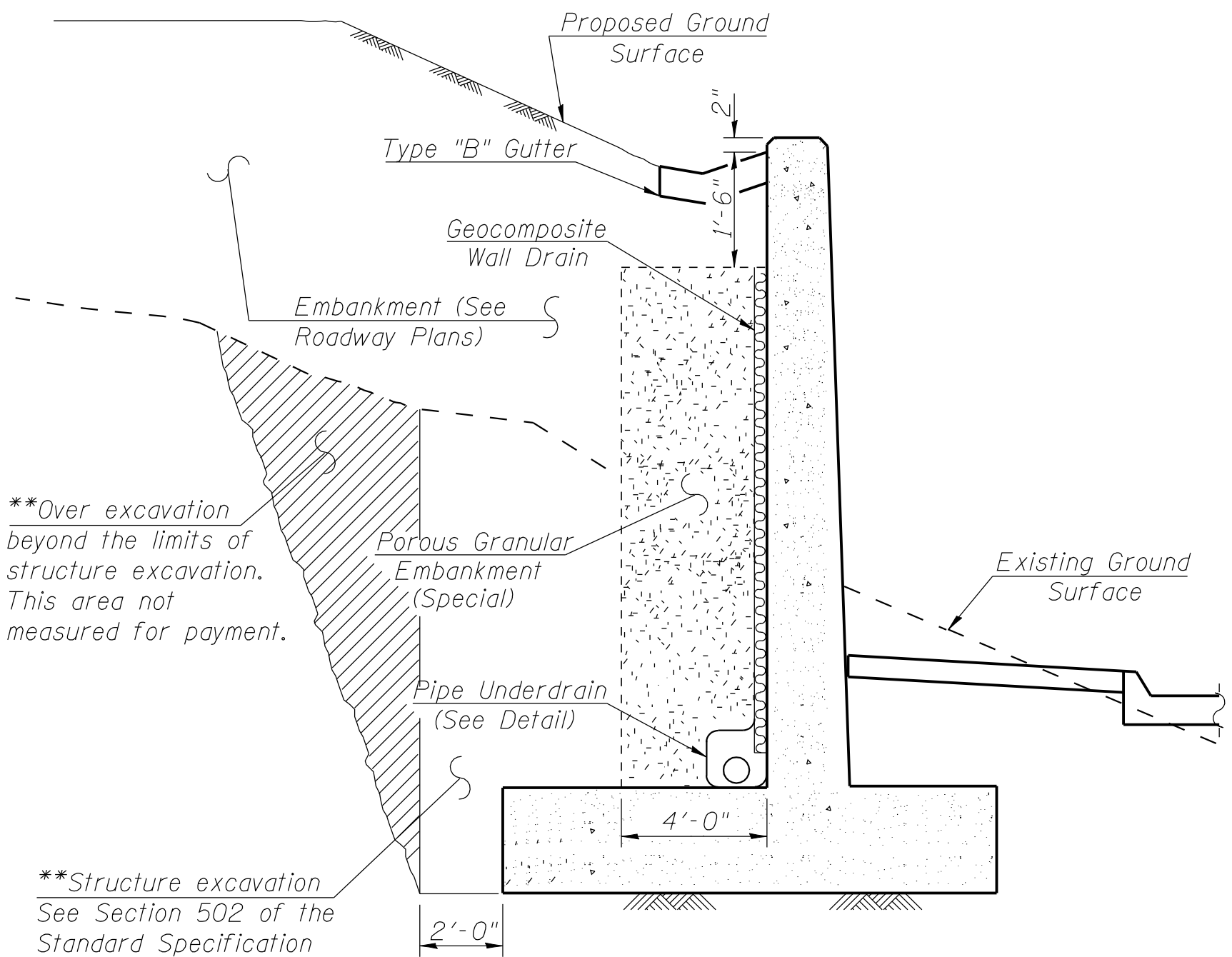
TYPICAL SECTION THRU
FILLED VAULTED ABUTMENT



TYPICAL SECTION THRU
PILE BENT ABUTMENT



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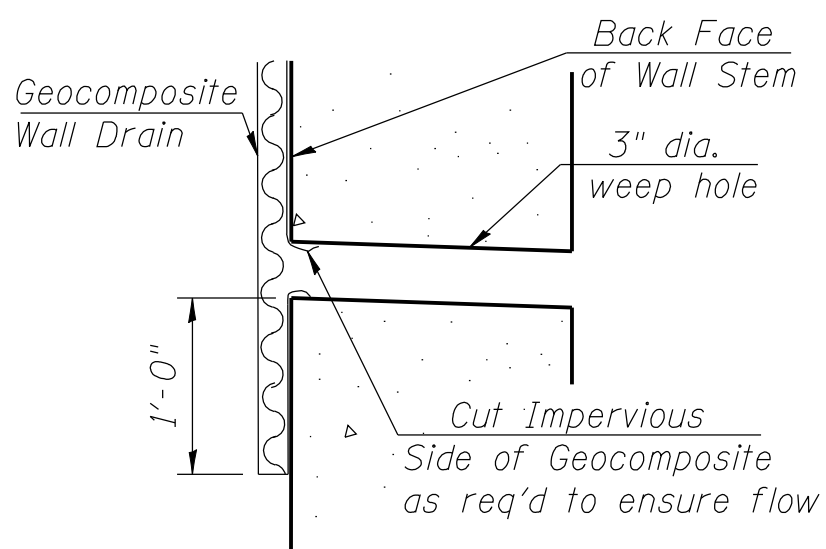
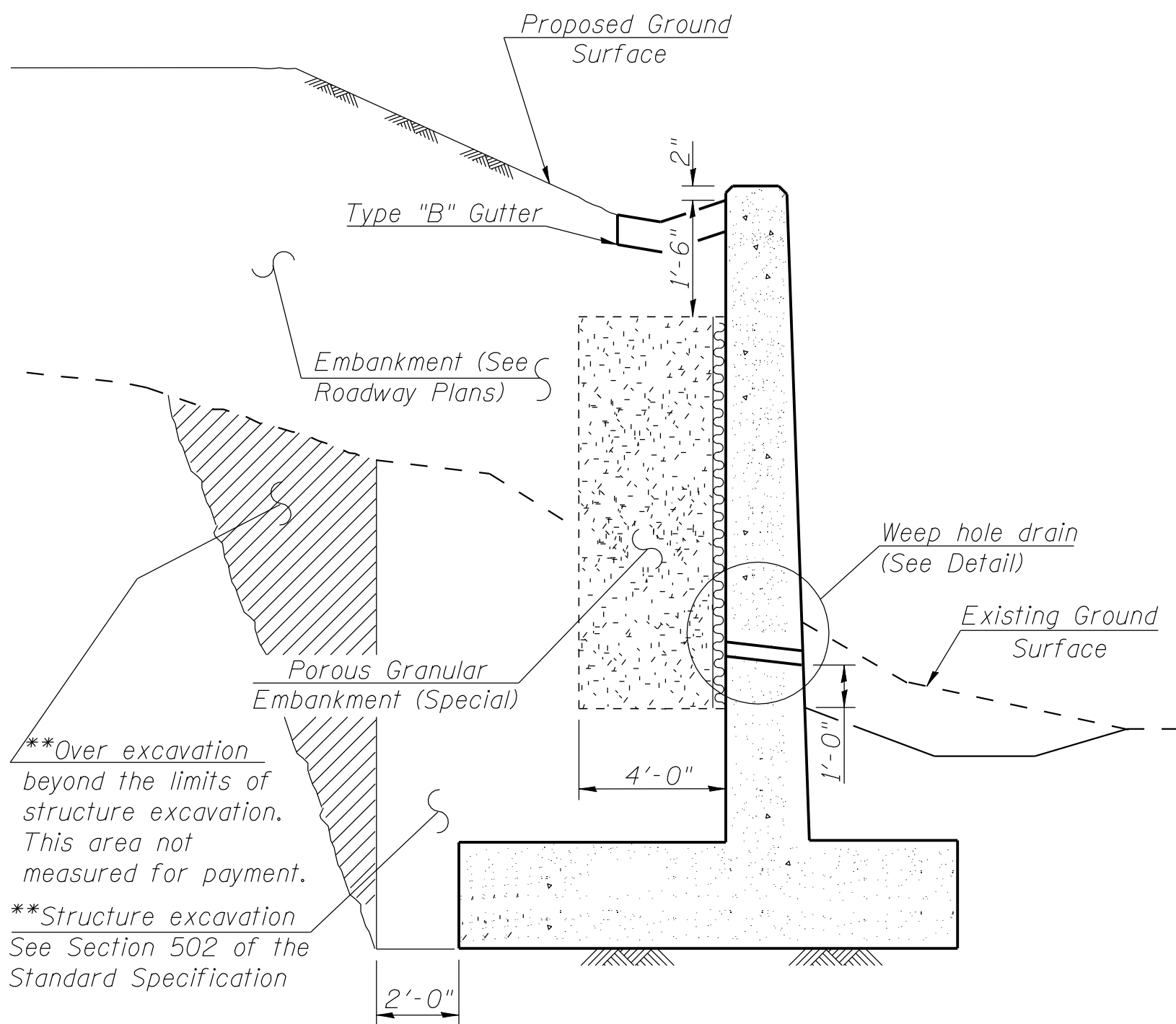


PIPE UNDERDRAIN DETAIL

TYPICAL SECTION THRU
T-TYPE WALL OR
CLOSED ABUTMENT
PIPE UNDERDRAIN OUTLET

*Included in the cost of "Pipe Underdrains for Structures"

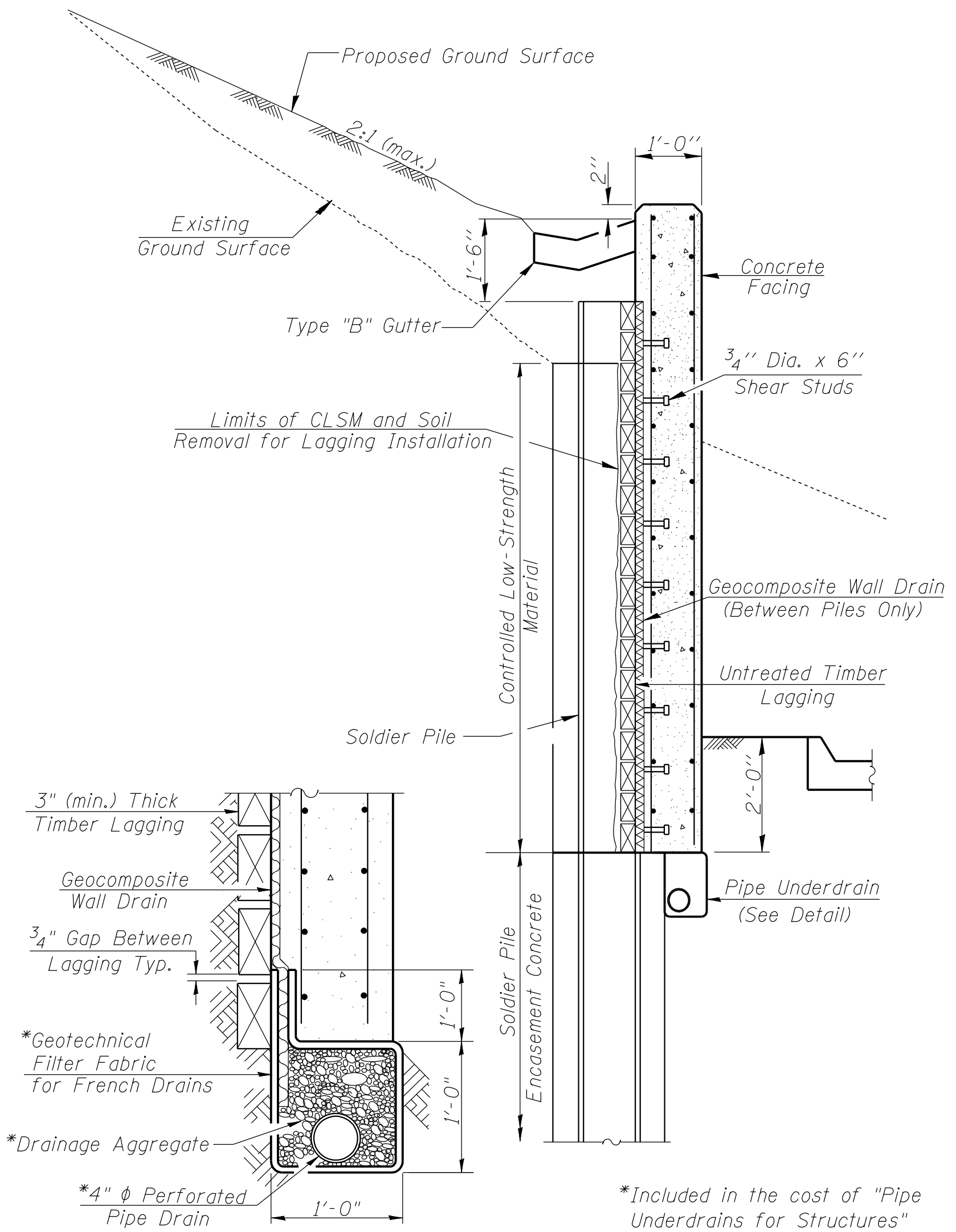
**Backfill remainder of structure excavation and over excavation with same material specified for roadway embankment.



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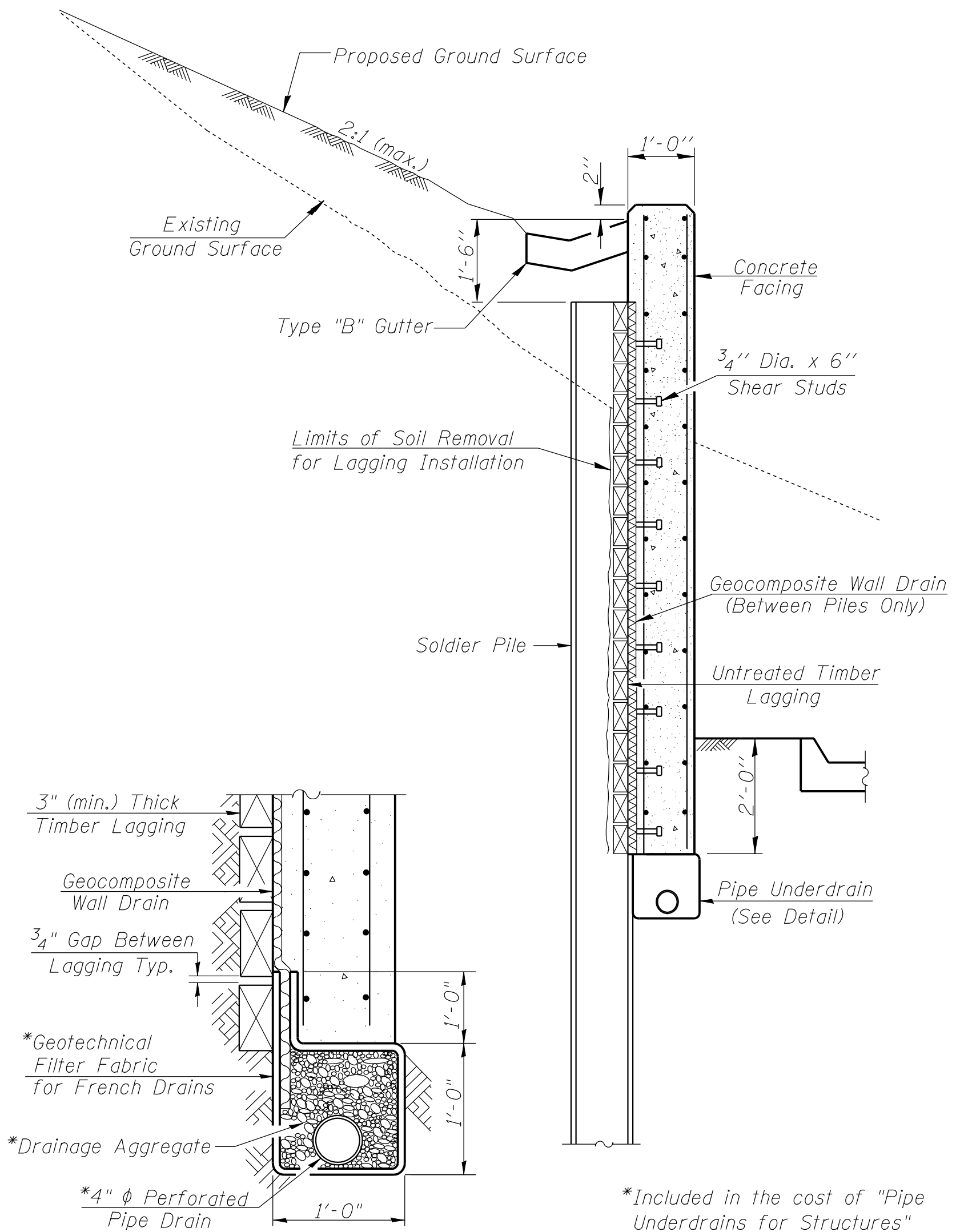
WEEP HOLE DRAIN DETAIL

TYPICAL SECTION THRU T-TYPE WALL OR CLOSED ABUTMENT WITH WEEP HOLE OUTLET



PIPE UNDERDRAIN DETAIL
(Between piles shown, at piles similar)

**TYPICAL SECTION THRU
DRILLED SOLDIER PILE WALL
WITH C.I.P. FACING**



PIPE UNDERDRAIN DETAIL
 (Between piles shown, at piles similar)

**TYPICAL SECTION THRU
 DRIVEN SOLDIER PILE
 WITH C.I.P. FACING**